CLAIMS

What is claimed is:

1. An apparatus to measure a concentricity of optical components in an optical assembly, said optical assembly comprising a header with a photonic device mounted thereon, said photonic device having a first optical axis, said optical assembly further comprising a cap having a lens therein, said lens having a second optical axis, the apparatus comprising:

a chuck configured to support said optical assembly, said chuck being adapted to support said optical assembly without obstructing a view of at least a portion of said lens; and

a visual display system adapted to depict a position of said lens relative to said photonic device and to measure said position.

2. The apparatus of claim 1, wherein said measurement is used to determine said concentricity between said first optical axis and said second optical axis.

3. The apparatus of claim 1, wherein said visual display system comprises at least one camera and at least one video display.

4. The apparatus of claim 3, wherein said camera further comprises a zoom lens.

WORKMAN NYDEGGER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

5. The apparatus of claim 3, wherein said visual display system includes a video overlay including at least one calibration feature that allows said concentricity to be measured.

6. The apparatus of claim 5, wherein said calibration feature allows said concentricity to be measured to within 1 micron.

7. The apparatus of claim 1, wherein said lens is a ball lens and said photonic device is a laser.

8. The apparatus of claim 7, wherein said first optical axis is collinear with a beam emitted from said laser.

9. The apparatus of claim 7, wherein said second optical axis passes through a center of said ball lens.

10. The apparatus of claim 1, wherein said visual display system is movable relative to said chuck.

11. The apparatus of claim 1, wherein said chuck is movable relative to said visual display system.

WORKMAN NYDEGGER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

12. A method for measuring a concentricity of optical components in an optical assembly comprising:

a step for providing an optical assembly, said optical assembly having at least one component mounted on a base;

a step for mounting said optical assembly in a chuck;

a step for measuring said concentricity of said component relative to said base using a visual display system.

13. The method of claim 12, wherein said visual display system comprises at least one camera and at least one video display.

14. The method of claim 13, wherein said camera further comprises a zoom lens.

15. The method of claim 13, wherein said component is a laser having a first axis and said base is a header having a second axis parallel to said first axis, and wherein the step for measuring measures the distance between said first axis and said second axis.

16. The method of claim 13, wherein said visual display system includes a video overlay including at least one calibration feature that allows said concentricity to be measured.

WORKMAN NYDEGGER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

17. The method of claim 16, wherein said calibration feature allows said concentricity to be measured to within 1 micron.

WORKMAN NYDEGGER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

18. A method for measuring a concentricity of optical components in an optical assembly, said optical assembly comprising a header with a photonic device mounted thereon, said photonic device having a first optical axis, and a cap having a lens therein, said lens having a second optical axis, said method comprising:

a step for viewing said photonic device through said lens;

a step for measuring a distance between said first optical axis and said second optical axis.

19. The method of claim 18, wherein said step for viewing comprises a step for viewing said photonic device by a video display system.

20. The method of claim 19, wherein said video display system comprises at least one camera and at least one video display.

21. The method of claim 20, wherein said camera further comprises a zoom lens.

22. The method of claim 20, further comprising a step for overlaying a calibration pattern on said video display.

23. The method of claim 22, wherein said calibration pattern allows said distance to be measured to within 1 micron.

WORKMAN NYDEGGER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

24. The method of claim 18, wherein said lens is a ball lens and said photonic device is a laser.

25. The method of claim 24, wherein said first optical axis is collinear with a beam emitted from said laser.

26. The method of claim 25, wherein said second optical axis passes through a center of said ball lens.

27. The method of claim 18, wherein said optical assembly is held in an arm and said visual display system is movable relative to said arm.

28. The method of claim 18, wherein said optical assembly is held in an arm and said arm is movable relative to said visual display system.

WORKMAN NYDEGGER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111